human bodies, the variance may increase substantially. In some cases, the presence of a "still" human body may double or triple the variance. Alternatively or additionally, another metric can be a measured change in angle of arrival. The angular change might be situation dependent as the direct LoS path can give way to the primary reflection path. By way of example, a measurable change in the angle of arrival (e.g., +/−5 degrees) may indicate that the LoS path is obstructed.

[0056] In addition to a change in a measured distance, an amount of distortion in the measured signal, which can manifest as an amount of variation in a measured distance (e.g., snapshot measurements, measurements over time, etc.) can be used to determine a type of detected object. For example, a sofa may be constructed of uniform and inert materials, which can change the TOF measurement and measured distance, but the change may be relatively constant. On the other hand, a human being is comprised of solids and moving liquids, which can change the TOF measurement and corresponding determined distance, but can additionally exhibit relatively more distortion (e.g., continuous change) in the TOF measurements. These changes in the magnitude of a detected distortion in TOF measurements can be used to tell the difference between animate and inanimate objects, and is further discussed below with respect to FIGS. **14-15**. In further embodiments, characteristics other than a magnitude of distortion can be used to determine a type of detected object. For instance, a frequency content of the noise/distortion between different object may be used, or the difference in distortion between two different sets of transmitter/receiver measurements can be used. One of ordinary skill in the art with the benefit of this disclosure would understand the many variations, modifications, and alternative embodiments thereof.

[0057] In some embodiments, a vector for the detected object can be determined in a number of ways. For example, multiple host units in communication with one another (e.g., as shown in FIG. **7** below) can create a mesh of virtual trip wires. As a user traverses a number of the virtual trip wires, a trajectory and speed can be determined, with potentially greater resolution and accuracy with a greater density of virtual trip wires, as shown and described below with respect to FIGS. **16-17**.

[0058] In certain embodiments, two or more people (users) passing through a common virtual tripwire may be detected and differentiated based on one or more of their biometrics. For instance, consider the scenario where two people are walking toward each other and pass one another at a virtual tripwire. It may not be clear from the virtual tripwire measurement data if the two people passed each other and continued walking in the same direction, or if they stopped and turned around to back in the opposite direction. In such cases, biometrics such as a person's heart rate can be measured wirelessly (e.g., via a 60 GHz millimeter wave sensor (MWS) system) to differentiate between people, as shown and described below with respect to FIG. **18**. Other characteristics can be used as well, including a person's detected speed, gate, size, or other features that may be particular to certain users.

[0059] In further embodiments, a detected user can be authenticated in a number of ways. For example, user data may be received that corresponds to the detected object (user). A confidence level can be assigned to the detected user based on a quality of the user data. For instance, a user's biometrics data (e.g., heart rate, iris data, fingerprint data, gate, size, etc.) may increase the confidence level that the detected user is who they purport to be. If the user has a cryptographic key, password, or other data, the confidence level can be increased as well. Certain permissions can be assigned to the detected user based on the confidence level. For example, if the user has a password only, then they may not be granted access to resources (e.g., home security controls, safe access, etc.) or certain areas of the home. If that user also has a cryptographic key and their detected heart rate matches characteristics of a stored heart rate associated with the user, then the confidence level may be high enough to grant full access to all resources and locations in the home, assuming that the particular user was authorized to do so, as shown and described below with respect to FIG. **19**. In some cases, a detected heart rate, or any of the other methods of authentication, may be afforded higher or lower values of influence (e.g., weighted value) for affecting a determined confidence level. One of ordinary skill in the art with the benefit of this disclosure would understand the many variations, modifications, combinations, and alternative embodiments of the various concepts described above and throughout the remainder of this disclosure and would appreciate that any combination of these concepts may be possible unless expressly indicated otherwise.

[0060] To improve the understanding and purview of the embodiments that follow, some of the terms used throughout the present disclosure are described herein. A "floorplan" can be a representation (e.g., a digital representation) of a complete or partial structural layout of a building. A floorplan can be the same as a blueprint. The floor plan can represent the locations of various structures, objects, etc., within the building, including dimensions and locations, as well as distances between said structures and objects, as would be appreciated by one of ordinary skill in the art with the benefit of this disclosure. The floor plan can be an output (e.g., rendered on a display for a user, printed on paper) or a digital file accessed, updated, processed, etc., by the systems described herein.

[0061] A "support structure" can be a structural element of the building, such as the walls, floor, ceiling, support column, chimney, or the like. In some embodiments, the support structure may not be structurally integrated with the building and can include a table, chair, appliance, couch, cabinet, or the like. That is, host units can be integrated with (installed in, coupled to, etc.) any support structure and one of ordinary skill in the art with the benefit of this disclosure would understand that the embodiments described herein are not limited and other implementations, though not explicitly described, would still fall within the purview of the present disclosure.

[0062] A "building" can be any enclosure with one or more walls and may include residential, commercial, or industrial structures, structures with or without a ceiling or floors (e.g., a walled enclosure such as a stadium, tent structure, etc.), or the like. A building can be referred to as a "structure," not to be confused with a "support structure," as defined above.

[0063] A "modular accessory" can be an accessory that is a self-contained unit that, for example, can be repeatedly installed and removed from the host unit. A modular accessory may be referred to as a module, and examples of the various accessories are shown and described below at least